UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Melanie D. Davenport, Director
Division of Water Quality Programs
Virginia Department of Environmental Quality
629 East Main Street
P.O. Box 1105
Richmond, Virginia 23218

Dear Ms. Davenport:

The U.S. Environmental Protection Agency (EPA), Region III, is pleased to approve the Phased Total Maximum Daily Loads (TMDLs) to address the aquatic life use (general standard-benthic) impairments in Phillips Creek, North Fork, and South Fork Pound River located in Wise County, Virginia. The TMDL report was submitted to EPA for review on April 19, 2010. The TMDLs were established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act to address impairments of water quality as identified in Virginia's Section 303(d) lists.

In accordance with Federal regulations at 40 CFR §130.7, a TMDL must comply with the following requirements: (1) be designed to attain and maintain the applicable water quality standards; (2) include a total allowable loading and as appropriate, wasteload allocations for point sources and load allocations for nonpoint sources; (3) consider the impacts of background pollutant contributions; (4) take critical stream conditions into account (the conditions when water quality is most likely to be violated); (5) consider seasonal variations; (6) include a margin of safety (which accounts for uncertainties in the relationship between pollutant loads and instream water quality), and (7) be subject to public participation. The benthic phased TMDLs for Phillips Creek, North Fork and South Fork Pound River satisfy each of these requirements. In addition, the TMDLs consider reasonable assurance that the TMDL allocations assigned to nonpoint sources can be reasonably met. A copy of EPA's Decision Rationale for approval of these TMDLs has been included with this letter.

As you know, all new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL wasteload allocations pursuant to 40 CFR §122.44 (d)(1)(vii)(B). Please submit all such permits to EPA for review as per EPA's letter dated October 1, 1998.

If you have any questions please call me, or have your staff contact Greg Voigt, Virginia TMDL Coordinator, at 215-814-5737.

Sincerely,

Jon M. Capacasa, Director
Water Protection Division

Enclosure

cc: David Lazarus

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Decision Rationale
Phased Total Maximum Daily Loads for the Aquatic Life Use (General Standard - Benthic) Impairments in the Pound River Watershed Wise County, Virginia

/S/

Jon M. Capacasa, Director
Water Protection Division

Date: April 28, 2011

Decision Rationale
Phased Total Maximum Daily Loads for the
Aquatic Life Use (General Standard - Benthic) Impairments
Pound River Watershed, Wise County, Virginia

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed for those waterbodies identified as impaired by a state where technology-based and other controls will not provide for the attainment of water quality standards. A TMDL is a determination of the amount of a pollutant from point, nonpoint, and natural background sources, including a Margin of Safety (MOS), that may be discharged to a water quality-limited waterbody.

This document will set forth the U.S. Environmental Protection Agency's (EPA) rationale for approving the TMDLs for the aquatic life use (general standard - benthic) impairments in the Pound River watershed. EPA's rationale is based on the determination that the TMDLs meet the following seven regulatory conditions pursuant to 40 CFR Part 130.

1. The TMDLs are designed to implement applicable water quality standards.
2. The TMDLs include a total allowable load as well as individual wasteload allocations (WLAs) and load allocations (LAs).
3. The TMDLs consider the impacts of background pollutant contributions.
4. The TMDLs consider critical environmental conditions.
5. The TMDLs consider seasonal environmental variations.
6. The TMDLs include a MOS.
7. The TMDLs have been subject to public participation.

In addition, these TMDLs considered reasonable assurance that the TMDL allocations assigned to nonpoint sources (NPSs) can be reasonably met.

II. Background

The Virginia Department of Environmental Quality (VADEQ) placed three impaired segments of the Pound River watershed on the 1998 Section 303(d) List of Impaired Waters for failure to meet the aquatic life (general standard - benthic) use: South Fork Pound River (Q13R-01-BEN); North Fork Pound River (Q13R-02-BEN), and Phillips Creek (Q13R-04-BEN). VADEQ has delineated the benthic impairment in the Pound River watershed as follows: 8.61 miles on the South Fork Pound River, 1.11 miles on the North Fork Pound River, and 2.14 miles on Phillips Creek.

The impaired segments of the Pound River watershed are located within the Tennessee Big Sandy River Basin in Wise County, Virginia. Phillips Creek is located north of Pardee, Virginia, and flows northeasterly into the South Fork Pound River. The North and South Forks of Pound River flow into the Pound River which flows northeasterly into Russell Fork, which flows northwesterly into Kentucky. The entire watershed is approximately 23,364 acres in size. The main land use category in the watershed is forest (68%). The remainder of the Pound River watershed consists of mining-related land uses (23%), agriculture (5%), and urban/residential

land uses (4%).

A complete section 303(d) listing history of the impaired stream segments located within the Pound River watershed is provided in Table 1.

Table 1. Section 305(b)/303(d) Listing History for the Pound River Watershed.

Stream Name	Impairment	1998 303(d) ID	2002 303(d) ID	2004 303(d) ID	2006 303(d) ID	2008 303(d) ID	305(b) ID
South Fork Pound River	Benthic	*VAS-Q13R	VAS-Q13R	VAS-Q13R-01	00398	Q13R-01-BEN	VAS-Q13R_PNS01A02, VAS-Q13R_PNS01A94, VAS-Q13R_PNS02B04
North Fork Pound River	Benthic	*VAS-Q13R	VAS-Q13R	VAS-Q13R-02	00397	Q13R-02-BEN	VAS-Q13R_PNK01A96
Phillips Creek	Benthic	N/A	VAS-Q13R	VAS-Q13R-04	00398	Q13R-01-BEN	VAS-Q13R_PNS02A02

*Consent Decree ID

The impaired segments of the Pound River watershed were identified based on the Virginia Stream Condition Index (VaSCI). Since 2008, VADEQ has used the VaSCI to measure and classify the health of benthic macroinvertebrate communities and to assess the attainment of the general standard. The index is based on eight bio-monitoring metrics, with a scoring range of 0-100. The threshold criteria of the VaSCI scoring system defines "non-impaired" sites as those with a VaSCI of 60 or above, and "impaired" sites as those with a score below 60. In the Pound River watershed, the VaSCI scores assessed indicate that some pollutant(s) is interfering with the attainment of the General Standard as scores below 60 have been observed in the listed segments of the watershed.

The process outlined in EPA's Stressor Identification Guidance Document was used to identify the most probable stressor(s) to the benthic community in the Pound River watershed (EPA, 2000)[1]. The Stressor Identification Guidance Document provides a logical, scientific process by which the State can evaluate available information to identify the source(s) of impairment within a specified stream segment. The process has three main steps: (1) List candidate causes of impairment, (2) analyze the evidence, and (3) characterize the causes. A stressor identification analysis was conducted in the Pound River watershed based on listing information, biological data, habitat evaluations, published literature, and stakeholder input.

In the Pound River watershed, high total suspended solids (TSS) concentrations and poor habitat metrics led to the determination that excess sediment is the most probable stressor to the benthic community in the Pound River watershed. Additionally, widespread elevated levels of TDS and its related constituents – conductivity and sulfate – also led to TDS being included as a most probable stressor for two impaired stream segments located within the Pound River watershed: North Fork Pound River and Phillips Creek. As such, TMDLs were developed to address the sediment and TDS stressors in the Pound River watershed. Table 2 presents the results of the stressor identification analysis in the Pound River watershed.

1 EPA Stressor Identification Guidance Document. United States Environmental Protection Agency. Office of Water. Washington, D.C. December, 2000. EPA/822/B-00/025.

Table 2. Stressor Identification Analysis for the Pound River Watershed

Stream Name	Most Probable Stressor
South Fork Pound River	Sediment and TDS
North Fork Pound River	Sediment
Phillips Creek	Sediment and TDS

TMDL Computation

A TMDL is a written plan and analysis established to ensure that a waterbody will attain and maintain water quality standards. A TMDL is a scientifically based strategy that considers current and foreseeable conditions, the best available data, and accounts for uncertainty with the inclusion of a MOS value. The option is always available to refine a TMDL for resubmittal to EPA for approval if environmental conditions, new data, or the understanding of the natural processes change more than what was anticipated by the MOS.

Sediment TMDLs

The model selected for the development of the sediment TMDLs was the Virginia Tech modified version of the Generalized Watershed Loading Functions (GWLF) model. The GWLF model is a continuous simulation spatially-lumped parameter model that operates on a daily time step. The model estimates runoff and sediment loads delivered to streams from complex watersheds from both point and NPSs of pollution. Pollutant concentrations are then modeled over the duration of a representative model period and pollutant loads are adjusted until the TMDL endpoint is reached.

TDS TMDLs

The TDS TMDLs were calculated using a reference instream water quality endpoint for TDS (369 mg/L) in combination with average annual flows from the watershed and permitted discharges. The TMDL values were computed as the average load delivered at the outlet of the watershed if the TDS concentration is held constant. The Department of Mines, Minerals and Energy (DMME) provided the data used to calculate the average annual flows for the Pound River watershed. The flow data used are appropriate because they represent the best available information collected directly from the impaired watershed.

Phased TMDL Development

The benthic TMDLs developed for the Pound River watershed represent the product of Virginia's efforts to date. During the development of the TMDLs, uncertainties in representing the mining sources in preliminary modeling and the subsequent load allocations were identified. Therefore, this report is being presented as a phased TMDL in accordance with EPA guidance.[2] A phased TMDL has several stringent requirements, including all the major requirements of a completed non-phased TMDL. A phased TMDL should also include a schedule for reopening the TMDL.

2 Clarification Regarding "Phased" Total Maximum Daily Loads. Best-Wong, Benita. Assessment and Watershed Protection Division. US Environmental Protection Agency. August 2, 2006.

Tables 3 through 6 summarize the annual and daily phased benthic TMDLs developed to address the sediment and TDS stressors in the Pound River watershed.

Table 3. Total Maximum Daily Loads of Sediment expressed as an Average Annual Load for the Pound River Watershed.

Impaired Segment	TMDL (t/yr)	WLA (t/yr)	LA (t/yr)	MOS (t/yr)
North Fork Pound River	359.9	0.0	320	39.9
Phillips Creek	526.4	8.62	409	108.78
South Fork Pound River	3,621.10	15	3,012.90	593.20

Table 4. Total Maximum Daily Loads of Sediment expressed as a Daily Load for the Pound River Watershed.

Impaired Segment	TMDL (t/day)	WLA (t/day)	LA (t/day)	MOS (t/day)
North Fork Pound River	6.06	0.0	5.44	0.62
Phillips Creek	7.05	0.02	6.17	0.86
South Fork Pound River	35.36	0.04	31.15	4.17

Table 5. Total Maximum Daily Load of Total Dissolved Solids expressed as an Average Annual Load for the Pound River Watershed.

Impaired Segment	TMDL (kg/yr)	WLA (kg/yr)	LA (kg/yr)	MOS (kg/yr)
Phillips Creek	205,530	75,818	129,712	Implicit
South Fork Pound River	5,026,715	1,854,300	3,172,415	Implicit

Table 6. Total Maximum Daily Load of Total Dissolved Solids expressed as aDaily Load for the Pound River Watershed.

Impaired Segment	TMDL (kg/day)	WLA (kg/day)	LA (kg/day)	MOS (kg/day)
Phillips Creek	2,252	207	2,045	Implicit
South Fork Pound River	55,087	5,080	50,007	Implicit

The United States Fish and Wildlife Service has been provided with a copy of the TMDL.

III. Discussion of Regulatory Conditions

EPA finds that Virginia has provided sufficient information to meet all of the seven basic requirements for establishing aquatic life (general standard - benthic) TMDLs for the Pound River watershed. Additionally, Virginia provided reasonable assurance that the TMDLs can be met. EPA is, therefore, approving the phased TMDLs. EPA's approval is outlined according to the regulatory requirements listed below.

1) The TMDL is designed to meet the applicable water quality standards.

Virginia state law 9VAC25-260-10 (Designation of uses) indicates:

All state waters, including wetlands, are designated for the following uses: recreational uses, e.g., swimming and boating; the propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be expected to inhabit them; wildlife; and the production of edible and marketable natural resources, e.g., fish and shellfish.

The General Standard**,** as defined in Virginia state law 9 VAC 25-260-20, states:

State waters, including wetlands, shall be free from substances attributable to sewage, industrial waste, or other waste in concentrations, amounts, or combinations which contravene established standards or interfere directly or indirectly with designated uses of such water or which are inimical or harmful to human, animal, plant, or aquatic life.

Compliance with the General Standard is assessed by VADEQ through application of the VaSCI. Since 2008, VADEQ has used the VaSCI to measure and classify the health of benthic macroinvertebrate communities. The biological assessments conducted in the Pound River watershed indicate that some pollutant(s) is interfering with attainment of the General Standard, as impaired macroinvertebrate communities and VaSCI scores below 60 have been observed in the listed segments of the watershed.

The process outlined in EPA's Stressor Identification Guidance Document was used to identify the most probable stressor(s) to the Pound River watershed. A list of candidate causes was developed, and chemical and physical monitoring data provided evidence to support or eliminate the potential stressors. Individual metrics for biological and habitat evaluation were additionally used to determine if there were potential links to a specific stressor. In the Pound River watershed, sediment and TDS were identified as the most probable stressors to the benthic macroinvertebrate community. As such, TMDLs were developed to address the sediment and TDS stressors in the Pound River watershed. Table 2 presents the results of the stressor identification analysis in the Pound River watershed.

Numeric TMDL endpoints for both sediment and TDS were developed to represent the water quality goals that are to be achieved through the implementation of the phased benthic TMDLs for the Pound River watershed. Currently, Virginia does not have numeric instream criteria for sediment or TDS. As a result, a reference watershed approach was used to estimate both the sediment and TDS load reductions needed to restore a healthy aquatic community and thus allow the Pound River watershed to achieve its designated uses. A reference watershed approach is based on selecting a non-impaired watershed that shares similar land use, ecoregion, and geomorphological characteristics with the impaired watershed. The stream conditions and loadings in the reference stream are assumed to be the conditions needed for the impaired stream to attain water quality standards. Therefore, the TMDL intends to replicate the loadings of the reference watershed in the impaired watershed.

Selection of Reference Watershed for Sediment

Due to similarities in land use, ecoregion, and geomorphological characteristics, Burns Creek was chosen as the reference watershed for the North Fork Pound River. For the impairments in the South Fork Pound River and its downstream tributary -- Phillips Creek, the Upper Dismal Creek was selected as the reference watershed. The size of the reference

watersheds were adjusted to match the area of the impaired watersheds. Land use distributions and other watershed characteristics were preserved throughout this adjustment. The sediment TMDL endpoints were then established as the sediment load from the area-adjusted reference watersheds.

Selection of Reference Watershed for TDS

The Lower Dismal Creek was chosen as the reference watershed for the South Fork Pound River and Phillips Creek due to similarities in mining activities, average elevation, population density, and land use distribution. A downstream monitoring station in the Lower Dismal Creek, 6ADIS001.24, was used to assess an appropriate TMDL endpoint for TDS. Several bioassessment samples have been taken at this site and were assessed as having a healthy benthic community. The TDS TMDL endpoint for the South Fork Pound River and Phillips Creek was set at 369 mg/L, the 90th percentile of 34 VADEQ-monitored TDS samples taken at station, 6ADIS001.24.

2) The TMDL includes a total allowable load as well as individual wasteload allocations and load allocations.

Total Allowable Loads

Virginia indicates that the total allowable loading is the sum of the loads allocated to nonpoint and point sources. Tables 3 through 6 in this Decision Rationale provide the total allowable loads for sediment and TDS in the Pound River watershed, calculated on an annual and daily basis.

Wasteload Allocations

EPA regulations require that an approvable TMDL include individual WLAs for each point source. According to 40 CFR §122.44(d)(1)(vii)(B), "Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with assumptions and requirements of any available WLA for the discharge prepared by the state and approved by EPA pursuant to 40 CFR §130.7." Furthermore, EPA has authority to object to the issuance of any National Pollutant Discharge Elimination System (NPDES) permit that is inconsistent with the WLAs established for that point source.

Phased Sediment TMDLs

In the Pound River watershed there are four single family home general permits, seventeen coal mining permits, thirty-one active gas and oil permits, and six plugged released gas and oil permits.

Table 2.18 in the TMDL Report presents the permit data for the gas and oil permits within the Pound River watershed. However, there are no discharge permits currently issued for any gas and oil facilities. During the next phase of development for this TMDL, DMME should consider developing WLA's for these facilities, as appropriate. Any potential contributions from these operations were included in the LA of the TMDL. The fact that EPA is approving this approach for purposes of this TMDL should not be construed as agreement by EPA that the

sediment discharges from these operations described by the TMDL do not require an NPDES permit.

For the single family home permits in the Pound River watershed, WLAs were calculated based on the facility's design discharge, multiplied by the permitted TSS concentration and then multiplied by conversion factors to get a permit load in metric tons per year (ton/yr).

The annual WLAs for the coal mining permits were derived in the following manner: NPDES bimonthly monitoring data in the watershed was selected for each year from 1995 to 2009 for each construction discharge location. The data utilized consisted of sample date, flow, and concentration for TSS. Each sample record was weighted for the number of days the sample represents and multiplied by the flow and concentration to get the loading in kilograms for that particular sample. The median of the annual wasteloads was then assigned as the mining WLA for the watershed.

Daily point source WLAs in the watershed were developed by dividing the annual loads by 365. Table 7 provides the WLAs for the Pound River Sediment Watershed TMDL.

Table 7. Wasteload Allocation for the Pound River Watershed Sediment TMDL

Permit Name	Permit ID	WLA (t/yr)	WLA (t/day)
North Fork Pound River:			
N/A	N/A	0.0	0.0
TOTAL		**0.0**	**0.0**
Phillips Creek:			
Fox Gap Mine	1100033	0.30	0.0008
H.E. #1 Mine	1100520	1.07	0.0029
Upper Phillips Creek Mine	1100787	1.56	0.0043
Flat Gap Mine	1101272	3.05	0.0083
High Splint Surface Mine #2	1101565	0.39	0.0011
Backbone Ridge Surface Mine	1101760	0.51	0.0014
Parsons #1 Mine	1201664	0.00	0.0000
Straight Fork Surface Mine	1501778	0.01	0.0000
West Phillips Creek Mine	1600876	1.73	0.0047
TOTAL		**8.62**	**0.02**
South Fork Pound River:			
Fox Gap Mine	1100033	0.30	0.0008
Steer Branch Prep Plant #2 Strip	1100044	0.01	0.000
H.E. #1 Mine	1100520	1.22	0.0033
Buck Knob Mine	1100717	1.44	0.0039
Upper Phillips Creek Mine	1100787	1.56	0.0043
Mine #2	1101102	0.17	0.0005
Four Lane Permit	1101270	0.18	0.0005
Flat Gap Mine	1101272	4.23	0.0116
North Fox Gap Surface Mine	1101401	2.82	0.0077
High Splint Surface Mine #2	1101565	0.39	0.0011
Backbone Ridge Surface Mine	1101760	0.51	0.0014
Phillips Creek Deep Mine	1201187	0.06	0.0002
Stillhouse Branch Mine	1201338	0.11	0.0003

Permit Name	Permit ID	WLA (t/yr)	WLA (t/day)
Parsons #1 Mine	1201664	0.00	0.0000
Straight Fork Surface Mine	1501778	0.01	0.0000
West Phillips Creek Mine	1600876	1.73	0.0047
Centurion Mine	1601939	0.14	0.0004
Single Family Home	VAG400005	0.04	0.0001
Single Family Home	VAG400274	0.04	0.0001
Single Family Home	VAG400556	0.04	0.0001
TOTAL		**15.00**	**0.04**

Phased TDS TMDLs

The WLA portion of the Pound River watershed TMDL includes TDS contributions from seventeen mining permits. To calculate the TDS loads generated from each mining permit, the average annual flows delivered from each permitted discharge was multiplied by the water quality endpoint for TDS (369 mg/l). The Department of Mines, Minerals and Energy (DMME) provided the average annual flows for the permitted discharges.

The point source WLAs developed for the Pound River watershed were computed as an average annual load in kilograms per year (kg/yr). The daily WLAs were calculated by dividing the annual loads by 365. Table 8 provides the WLAs developed for the South Fork Pound River and Phillips Creek TDS TMDLs.

Table 8. Wasteload Allocation for the Pound River Watershed TDS TMDL

Permit Name	Permit ID	WLA (kg/yr)	WLA (kg/day)
South Fork Pound River:			
Fox Gap Mine	1100033	10,761	29
Steer Branch Prep Plant #2 Strip	1100044	1,213	3
H.E. #1 Mine	1100520	203,606	558
Buck Knob Mine	1100717	384,095	1,052
Upper Phillips Creek Mine	1100787	224,403	615
Mine #2	1101102	33,593	92
Four Lane Permit	1101270	32,771	90
Flat Gap Mine	1101272	177,579	487
North Fox Gap Surface Mine	1101401	558,431	1,530
High Splint Surface Mine #2	1101565	4,360	12
Backbone Ridge Surface Mine	1101760	4,134	11
Phillips Creek Deep Mine	1201187	15,556	43
Stillhouse Branch Mine	1201338	22,656	62
Parsons #1 Mine	1201664	19	0
Straight Fork Surface Mine	1501778	35	0
West Phillips Creek Mine	1600876	26,046	71
Centurion Mine	1601939	155,042	425
TOTAL		**1,854,300**	**5,080**
Phillips Creek:			
Fox Gap Mine	1100033	6,557	18
H.E. #1 Mine	1100520	12,031	33
Upper Phillips Creek Mine	1100787	16,339	45

Permit Name	Permit ID	WLA (kg/yr)	WLA (kg/day)
Flat Gap Mine	1101272	1,916	5
High Splint Surface Mine #2	1101565	3,065	8
Backbone Ridge Surface Mine	1101760	5,178	14
Parsons #1 Mine	1201664	23	0
Straight Fork Surface Mine	1501778	43	0
West Phillips Creek Mine	1600876	30,666	84
TOTAL		**75,818**	**207**

Load Allocations

According to Federal regulations at 40 CFR §130.2(g), LAs are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting loading. Wherever possible, natural and nonpoint source loads should be distinguished.

Phased Sediment TMDLs

The LA was calculated as the target TMDL load minus the WLA load minus the MOS value. The sediment loads assigned to the LA in the Pound River watershed are presented in Tables 3 and 4. The primary nonpoint source contributions of sediment in the watershed include: abandoned mine land (AML), barren land uses, and outflow from dams.

Phased TDS TMDLs

The LA was calculated as the target TMDL load minus the WLA load minus the MOS value. The TDS loads assigned to the LA in the Pound River watershed are presented in Tables 5 and 6. The primary nonpoint source contributions of TDS in the watershed include: AML, residential, pre-law mine discharge, and road salt.

The fact that EPA is approving this TMDL, which includes discharges during surface runoff events and discharges from pre-law mines as part of the load allocation should not be construed as a determination by EPA that there are no discharges within these categories that require an NPDES permit.

3) The TMDLs consider the impacts of background pollution.

Where it is possible to separate natural background from NPSs, the TMDL should account for natural background pollutant loads.

Phased Sediment TMDLs

The impact of background pollutants were accounted for in the watershed by considering the loadings from background sources, such as forests, and calibrating the model to observed conditions.

Phased TDS TMDLs

The impact of background pollutants were accounted for in the watershed by considering

the loadings from background sources, such as road salt and TDS from background groundwater loadings. The TDS loads from these sources were represented in the 15 years of instream data that was used to calculate the TMDL value for the watershed.

4) The TMDLs consider critical environmental conditions.

According to EPA's regulation 40 CFR §130.7 (c)(1), TMDLs are required to take into account critical conditions for stream flow, loading, and water quality parameters. The intent of this requirement is to ensure that the water quality of the Pound River watershed is protected during times when it is most vulnerable.

Phased Sediment TMDLs

The GLWF water quality model used a weather input file which accounts for a wide range of climatic conditions. The allocations developed in the TMDLs will therefore ensure that the criteria are attained over a wide range of environmental conditions, including wet and dry weather conditions. The models, therefore, incorporate the variable inputs needed to represent critical conditions during low flow – generally associated with point source loads – and critical conditions during high flow – generally associated with nonpoint source loads.

Phased TDS TMDLs

The approach used to calculate the TMDL accounts for critical conditions because it utilizes monitored flow data collected over multiple years, including all seasons and various flow regimes.

5) The TMDLs consider seasonal environmental variations.

Seasonal variations involve changes in stream flow and loadings as a result of hydrologic and climatological patterns. In the continental United States, seasonally high flows normally occur in early spring from snow melt and spring rain, while seasonally low flows typically occur during the warmer summer and early fall drought periods.

Phased Sediment TMDLs

Seasonal variations in hydrology, climatic conditions, and watershed activities were explicitly accounted for in the GLWF water quality model. Daily time steps were used for weather data and water balance calculations. The model also allowed for monthly-variable parameter inputs for evapotranspiration cover coefficients, daylight hours/day, and rainfall erosivity coefficients for user-specified growing season months.

Phased TDS TMDLs

The approach used to calculate the TMDL accounts for seasonal conditions because it utilizes monitored flow data collected over multiple years, including all seasons and various flow regimes.

6) The TMDLs include a Margin of Safety.

This requirement is intended to add a level of safety to the modeling process to account for any uncertainty. The MOS may be implicit, built into the modeling process by using conservative modeling assumptions, or explicit, taken as a percentage of the WLA, LA, or TMDL.

Phased Sediment TMDLs

An explicit MOS of roughly ten percent was used to account for uncertainties in the methodology used to determine sediment loadings.

Phased TDS TMDLs

An implicit MOS was used to account for uncertainties in the methodology used to determine the TDS loadings. The MOS is implicit based on the use of the conservative 90^{th} percentile of observed TDS concentrations in the reference watershed. In the reference watershed (Lower Dismal Creek) the 90^{th} percentile values were actually 15.5 percent lower than the maximum observed values.

7) The TMDL has been subject to public participation.

Virginia held public meetings to facilitate the development of the phased TMDLs. The first public meeting was held on March 25, 2008, at Pound Town Hall located in Pound, Virginia. The public meeting was attended by eleven stakeholders. A second public meeting was held on September 25, 2008, at Pound Town Hall. This public meeting was attended by twenty-one stakeholders. Following the meetings, thirty day public comment periods on the TMDLs were initiated. Virginia received and responded to all comments.

Uncertainties related to the modeling and source differentiation in the TMDL document led to the development of a phased TMDL approach. Phased TMDLs were drafted by DMME and were presented at a public meeting on February 2, 2010, at Pound Town Hall. Once submitted to review, significant revision requests pertaining to the phased TMDLs required that the report be revised. A public meeting was held at Pound Town Hall on February 28, 2011 to inform the public on the revisions to the phased TMDLs. This public meeting was attended by fifteen stakeholders. Following the meetings, thirty day public comment periods on the TMDLs were initiated. Virginia received and responded to all comments.

IV. Discussion of Reasonable Assurance

Current EPA guidance recommends that the phased TMDL approach be used in situations "where limited existing data are used to develop a TMDL and the State believes that the use of additional data or data based on better analytical techniques would likely increase the accuracy of the TMDL load calculation and merit development of a second phase TMDL"[3]. Because of uncertainties in representing mining sources in preliminary modeling and the subsequent load allocations, phased TMDLs are being developed for the sediment and TDS stressors identified in

3 Clarification Regarding "Phased" Total Maximum Daily Loads. Best-Wong, Benita. Assessment and Watershed Protection Division. US Environmental Protection Agency. August 2, 2006.

the impaired segments of the Pound River watershed. This two year window will allow for additional data collection to provide for a more accurate assessment of the watershed and the corresponding modeling parameters.

EPA requires that there be a reasonable assurance that a phased TMDL can be implemented. Once the phased sediment and TDS TMDLs for the Pound River watershed have been approved by EPA, measures must be taken to reduce pollution levels from both point and NPSs.

For the WLA component of this TMDL, EPA regulations require that an approvable TMDL include individual WLAs for each point source. According to 40 CFR §122.44(d)(1)(vii)(B), "Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with assumptions and requirements of any available WLA for the discharge prepared by the state and approved by EPA pursuant to 40 CFR §130.7." In this TMDL, all WLAs will be effective and implemented by the Division of Mined Land Reclamation (DMLR) through the NPDES permit program. VADEQ will permit non-coal dischargers in compliance with WLAs included in the TMDL and the agencies current policies and procedures. In addition, because these WLAs are water-quality based limits, the alternative provisions found in 40 CFR do not apply for TSS.

For the LA component of this TMDL, the implementation of NPSs will contribute to on-going water quality improvement efforts in the Pound River watershed. These include the ongoing efforts to re-mine and re-claim all previously abandoned mine land. Potential funding sources for implementation include: the Section 319 Nonpoint Source Management Program, the U.S. Department of Agriculture's Conservation Reserve Enhancement and Environmental Quality Incentive Programs, the Virginia State Revolving Loan Program, the Virginia Water Quality Improvement Fund, and the Abandoned Mine Lands program, although other sources are also available for specific projects and regions of the state.

Additional data collection is necessary to support the adequacy of the predictive tools used and the sufficiency of the available data's ability to determine the sediment and TDS load reductions for the Pound River watershed sediment and TDS TMDLs. The preliminary sampling plan presented below will be prioritized and implemented upon EPA approval.

TSS Phased TMDL Monitoring Plan

1. The DMLR required on June 1, 2009, that all mining permits with NPDES discharges into impaired watersheds must sample for TSS. This data will be utilized for the modeling used to determine mining WLAs.
2. Sampling of a stormwater event within the watershed exceeding two inches of rainfall will be coordinated by VADEQ and DMLR. The Federal effluent guidelines for the coal mining point source category (40 CFR Part 434) provide various alternative limitations for discharges caused by precipitation. Under those technology-based guidelines, effluent limitations for TSS may be replaced with an alternative limitation for settleable solids during certain magnitude precipitation events that vary by mining subcategory. The water quality-based WLAs in this TMDL preclude the applicability of the *alternative precipitation* provisions of 40 CFR Part 434. TSS monitoring during the two-year phased TMDL will be performed during the full range of storm events. This will improve the assessment of sediment loads from active mining areas.

3. Sampling of a stormwater event within the watershed exceeding two inches of rainfall will be coordinated by VADEQ and DMLR.
4. DMLR will utilize rainfall data from IFLOWS and the National Climatic Data Center to compare with instream and NPDES sampling events coalfield wide in order to ascertain whether or not sampling occurs during storm events greater than 0.2 inches.
5. DMLR will solicit input from modelers to determine if any additional data is needed.

TDS Phased TMDL Monitoring Plan

1. DMLR will develop a groundwater monitoring plan to quantify groundwater contribution of TDS from mine backfill areas and background levels of TDS from active mining operations and abandoned mine land areas. The monitoring plan will also quantify contributions of interflow.
2. DMLR and DEQ will conduct field reconnaissance of watersheds with TDS as a stressor to identify all abandoned deep mine discharges, not just those currently monitored as groundwater monitoring stations.
3. DLMR required on June 1, 2009, that all mining permits with NPDES discharges into impaired watersheds must sample for TDS. The data collected will be utilized for determining mining wasteloads modeling.

The results of the monitoring plan will be evaluated during the next phase of development for the Pound River watershed sediment and TDS TMDLs. Once this is done, the TMDL report will be modified or amended to represent the new information and will be submitted to EPA for approval as a final TMDL within two years (December 13, 2013).